

AMENDMENT UNDER 37 C.F.R. § 1.116
Application No.: 10/541,130

Attorney Docket No.: Q88762

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FEB 16 2010

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method of manufacturing a porous cementitious product, which method comprises in the following order:

(a) forming a cementitious premix;

(b) casting the premix in a formwork that shapes the premix in a desired configuration;

(c) generating gas bubbles within the premix thereby causing the premix to expand in the formwork; and

(d) controlling expansion of the premix in the formwork by confinement of the premix and causing gas bubbles at outer surfaces of the premix to collapse to produce dense outer regions; and

(e) curing the premix,

wherein, after casting but before curing of the premix, the gas bubbles are generated and/or collapsed at specific locations within the premix in step (a) the premix has a viscosity that will permit gas bubbles generated in the premix in step (b) to migrate through the premix, and wherein steps (c), (d) and (e) are performed in order to produce a porous cementitious product that has a porosity profile along a cross-section of the product such that the product comprises a relatively low density core region and higher density outer regions and wherein a formwork is used for shaping the premix in the desired configuration, wherein the premix is confined in the formwork in order to contribute to the porosity profile, and wherein gas bubbles at an outer surface of the premix are caused to collapse to produce a relatively dense skin and wherein the product has a maximum porosity of from 25 to 60% over a region corresponding to 20 to 80% along the cross-section of the product.

2. (previously presented): A method according to claim 1, wherein gas bubbles are generated by incorporation in the premix of a heat-activated gas-generating agent.

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3. (previously presented): A method according to claim 32, wherein the lid of the formwork is adapted to allow gas dissipation when gas bubbles collapse at the premix/lid interface.
4. (previously presented): A method according to claim 1, wherein, after casting but before curing of the premix, the upper surface of the premix is subjected to trowelling, screeding and/or rolling in order to cause collapsing of expanding premix.
5. (previously presented): A method according to claim 1, wherein, after casting but before curing of the premix, the formwork is vibrated vertically and/or laterally at an appropriate frequency and amplitude in order to achieve an even distribution of premix within the formwork, to control the cross-sectional bubble distribution and/or to improve smoothness of the product surfaces.
6. (previously presented): A method according to claim 4, wherein a formwork is used for shaping the premix and wherein the formwork is vibrated vertically and/or laterally at an appropriate frequency and amplitude in order to achieve an even distribution of premix within the formwork, to control the cross-sectional bubble distribution and/or to improve smoothness of the product surfaces.
7. (currently amended): A method according to claim 1, wherein, after casting but before curing of the premix, ~~one or more parting~~ a sparging lance ~~-lances are~~ is used to inject gas at selected locations into the premix.
8. (currently amended): A method according to claim 7, wherein the sparging ~~apparatus comprises a sparging lance comprising~~ comprises ~~an elongate hollow member having a series of holes through which gas may be injected into the premix.~~
9. (currently amended): A method according to claim 8, wherein the sparging lance is moved through the premix during gas injection to provide a distribution of bubbles appropriate to

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achieve the desired porosity profile.

10. (previously presented): A method according to claim 1, wherein, after casting but before curing of the premix, the premix is sufficiently viscous to achieve gas bubble retention but not so highly viscous so as to inhibit bubble formation.
11. (previously presented): A method according to claim 10, wherein the viscosity of the premix is controlled by varying the premix temperature, by blending of fine materials into the premix to obtain desired particle graduation for optimal flow properties and/or by incorporation into the premix of a superplasticising admixture.
12. (previously presented): A method according to claim 11, wherein the viscosity of the premix is controlled by incorporation into the premix of a superplasticiser.
13. (previously presented): A method according to claim 1, wherein the strength to density ratio of the cementitious product is controlled by varying the extent to which gas bubbles that have been generated in the premix are retained.
14. (previously presented): A method according to claim 1, wherein the strength to density ratio of the cementitious product is controlled by varying the degree of confinement of the premix as it expands due to generation of gas bubbles within the premix.
15. (previously presented): A method according to claim 1, wherein the strength to density ratio of the cementitious product is controlled by selection based on premix strength.
16. (previously presented): A method according to claim 1, wherein after casting but prior to curing of the premix, an upper surface of the premix is finished by cutting, trowelling, screeding or rolling.
17. (canceled).

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18. (currently amended): A method according to claim 1, wherein the premix is a high strength premix that on curing would yield a product having a compressive strength of ~~from~~ from 60 to 120 MPa (in non-gassed form).
19. (previously presented): A method according to claim 18, wherein the premix is used to manufacture a cementitious product having a dry density of from 1000 to 1500 kg/m³ and compressive strength of 10 to 25 MPa.
20. (previously presented): A method according to claim 18, wherein the cementitious product has a 1-day strength of from 75-90% of its 28-day strength.
21. (previously presented): A method according to claim 1, wherein curing of the premix takes place using heat at atmospheric pressure.
22. (previously presented): A method according to claim 1, wherein the cementitious product exhibits a flexural strength of from 3-4 MPa for compressive strengths of from 15-20 MPa for product densities of from 1300-1500 kg/m³.
23. (previously presented): A method according to claim 1, wherein the cementitious product has a thermal conductivity of from 0.3-0.6 W/m.K for product dry densities of from 900-1300 kg/m³.
24. (previously presented): A method according to claim 1, wherein high shear mixing is used to vary the premix temperature and/or the premix rheology thereby allowing the viscosity of the premix to be controlled prior to casting.
25. (previously presented): A method according to claim 18, wherein the cementitious product has residual water content of from 12-15% by weight.

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26. (previously presented): A method according to claim 1, wherein the cementitious product is manufactured in the form of a flat slab, wall panel, roofing tile, block-work system or paver.
27. (previously presented): A method according to claim 1, wherein the formwork includes surface relief in order to produce a patterned surface on the product.
28. (previously presented): A method of manufacturing at least two cementitious products which are formed from a single cementitious premix and which have a different ratio of strength to density, which method comprises forming each cementitious product in accordance with the method claimed in claim 1 and wherein the strength to density ratio of each cementitious product is controlled by varying the degree of confinement of the premix as it expands due to generation of gas bubbles within the matrix.
29. (previously presented): A cementitious product obtained by the method as claimed in claim 1.
30. (currently amended): A porous cementitious product having a porosity profile along a cross-section of the product such that the product comprises a relatively low density core region and higher density outer regions, and wherein the porosity increases gradually away from an outer surface of the product and decreases gradually towards another outer surface of the product, and wherein the product has a maximum porosity of from 25 to 60% over a region corresponding to 20 to 80% along the cross-section of the product, the higher density outer regions imparting impact resistance, abrasion resistance and resistance to water absorption.
31. (canceled).
32. (previously presented): A method according to claim 1, wherein the formwork has a lid in order to restrain rising of the premix and cause collapsing of expanding premix on contact with the lid.